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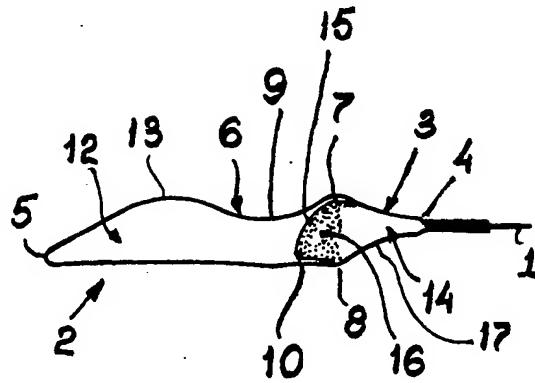
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(54) Title: KNIFE GRIP



(57) Abstract

A handle for a knife. The handle body (2) consists of a tapering head portion (14), an intermediary portion (6) and a tail portion (12). On the head portion (4) a rest (16) for the tip of the index finger is formed, whereas on one side of the intermediary portion (6) a concavely shaped supporting area (9) for the thumb and on the opposite side of both the head portion (4) and the intermediary portion (6) a supporting area (10, 17) for the middle finger are formed. The handle (2) according to the invention may be used both in the overhand grip and in two different penhold grips and therefore particularly suitable for a surgery knife.

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## Title: Knife Grip.

The invention relates to a handle for a knife blade extending therefrom in a cantilever fashion, comprising a handle body having a head portion, the thickness of which is increasing as seen from the blade insert end, an intermediary portion connected therewith and a 5 tail portion, wherein in use - i.e. with the knife positioned edgewise - the upwardly facing of the head portion surface and an immediately contiguous part of the intermediary portion are sloping rearwardly so as to function as a rest for a finger tip, and wherein on both of the opposite sides of the intermediary portion - 10 immediately adjacent the transition lines to the head portion-concavely profiled finger rests are formed.

Such a handle is known from EP-A-90256. A handle for relatively short knife blades is involved here, of the type, which is commonly used both by professionals and by do it yourself people for cutting 15 and severing e.g. floor covering or roofing material, leather or other material. When performing cutting operations of this kind usually relatively large forces have to be applied onto the handle. For this reason this well-known handle has been merely designed for use in the so-called fist grip, whereby the handle body is firmly enclosed in the 20 palm of the hand and whereby additional pressure may be applied on the upper face of the head portion of the handle body by means of either the index finger or the thumb. The proposal disclosed in the above mentioned patent specification aims at improving the handle for such a knife in ergonomic respect and more specifically in the sense that in 25 use the grip will be less convulsive. For this purpose it is proposed to widen the top surface of the head portion to a thumb or finger tip rest and to provide concavely shaped thumb and finger rests respectively on the two sidewalls. The handle is symmetrically formed, so that no distinction is to be made between handles for right hand use 30 and left hand use respectively.

The invention, however, more particularly relates to a handle for a very special type of knife, viz. a knife, with which the magnitude of the force to be exerted during use is of minor importance, but instead the "steering" of the knife and also the 35 cautious "dosage" of the force to be applied is of utmost importance. More particularly the invention is related to the usual operating knife in the operative surgery, a so-called scalpel, which in the

presently known embodiments have a relatively flat handle, lying in the plane of the blade. With this type of knife it is aimed at that the in the so-called overhand grip one of the fingers, usually the index finger, will rest - in use - on the upper side of the upright oriented handle, in order that this finger may steer the knife and may effect an accurate dosage of the force which is required e.g. for making an incision. Thumb and middle finger primarily function to prevent the knife from tilting and should rather firmly engage the sidewalls of the handle. As a consequence of this the grip around the handle is rather convulsive, which affects the sensitivity required for an adequate dosage of the force to be exerted.

It is an objective of the present invention to improve a handle of the type above referred to in such a way, that a handle is obtained which is more specifically suitable for use with an operating knife, and which allows a "loose" and therefore "sensitive" handling and yet provides for a stable grip.

In accordance with the invention this objective is achieved in that the head portion - as seen in plan view - has a triangular form with a relatively small apex angle, whereas the sidewalls of the head portion are tapering downwardly into a common edge, which extends from the blade insertion end obliquely downwardly and rearwardly, whereas that part of the middle portion which confines the two finger grip impressions is tapering downwardly as seen in a vertical cross section, and wherein the top surface, profiled as a finger tip rest, is sloping slightly downwardly from the right hand side to the left hand side when seen transversely.

The terms "right hand side" and "left hand side" used hereinabove and to be used below will have to be understood in relation to a handle for right hand use.

As distinguished from the well-known handle, the handle according to the present invention has a relatively pointy head portion, in which an accurately defined supporting surface for the index finger is provided. Due to the fact that this supporting surface is sloping slightly downwardly as seen transversely, the (slight) pressure of the finger onto this supporting surface will have a component directed to the thumb side, which relieves the middle finger. The handle of the invention may be "loosely" and yet stably held in the hand both in the overhand grip (wherein the handle is enclosed in the palm of the hand) and in the so-called penhold grip. In this way an operating knife may

be steered by the index finger in a sensitive manner, thereby enabling an accurate dosage of the force to be exerted on and with the knife. A particular advantage of the handle of the invention is to be seen in the possibility of selecting between two different "penhold grips",  
5 viz. a penhold grip whereby the middle finger is - in a rather stretched attitude - bearing laterally against the right hand side of the head portion of the handle body, and a penhold grip, whereby the middle finger is bearing laterally - in a more curved attitude - against the handle body onto the respective finger rest at a location  
10 just behind the transition to the inter-mediary handle portion. The two penhold grips are of equal value from an ergonomic point of view. In practice the choice between the two possibilities will e.g. be determined by the type of the action to be performed. As an example the first mentioned possibility is to be recommended when an incision  
15 has to be made, whereas the second possibility will be selected when "preparing" the incision site.

It is to be noted, that DE-A-2729749 discloses a penholder, in the generally torpedo-shaped holder body of which recesses are provided for thumb, index finger and middle finger. In this case the finger  
20 grip recesses are formed such, that they fix the penholder in a certain angular position with respect to the holding hand. Consequently such a holder would not be readily steerable in the plane of a knife to be fixed to it. Moreover the choice between two different penhold grips, which is essential in the handling of a surgery  
25 scalpel, does not exist here.

According to a further feature of this invention the left side of the intermediary portion is concavely profiled such that the surface of it, as seen with the handle in its upright position, is formed by a part of a substantially vertical cylindrical plane, which  
30 may function as a rest for a horizontally and edgewise positioned thumb.

The invention will be hereinafter further explained by way of example with reference to the drawing.

Fig. 1 and 2 show side elevations from both sides of the handle  
35 of this invention, as used with an operating knife, and seen from above in a slightly oblique direction and

fig. 3 is a plan view of the knife of fig. 1-2.

In the example shown in the drawing an operating knife consists of the proper knife or blade 1 and is provided with a handle 2

according to the invention. The handle 2 has an asymmetrical profile, which means that it is asymmetrically formed relative to the plane of the blade 1, so that for practical use the handle will have to be provided in two versions, viz. one for right hand use and one for  
5 left hand use.

The drawing shows the version for right hand use. This means, that fig. 1 shows the thumb side and fig. 2 shows the middle finger side of the handle.

The handle body is formed e.g. of a suitable plastics material  
10 and comprises a head portion 3, the horizontal cross-section of which having a thickness which gradually increases as seen from the forward or blade insert end 4 in the direction of the rear end 5; as a result this head portion 3 has a substantially triangular shape as seen in plan view. In a vertical cross-sectional plane the head portion 3 has  
15 a form which slightly tapers downwardly. The head portion 3 is connected to a middle portion 6, the thickness of which is first decreasing and then gradually increases. The transition lines between the head portion 3 and the middle portion 6 are indicated at 7 on the thumb side (fig. 1) and 8 on the middle finger side (fig. 2) respectively.

20 The side faces of the middle portion 6 are shaped such that on the thumb side a well fitting rest is obtained for a horizontally extending thumb put on its side. This rest (fig. 3) is - when considering the handle in its upright position (as in fig. 1 and 2)- composed of a part 9 of a substantially upright positioned cylindrical surface. Looking at the middle finger side, a slightly concavely formed rest 10 is provided in the first section of the respective sidewall of the middle portion 6, for contacting the middle finger in a curved attitude. This rest extends between the substantially vertically downwardly extending forward transition line 8 and a  
25 rearward transition line 11 which extends obliquely in a downward and rearward direction. The handle body is completed by a tail portion 12, which is tapering in the rearward direction. The transition between the middle portion 6 and the tail portion is indicated at 13 on the thumb side (fig. 1), whereas the transition on the middle finger side  
30 appears in a less pronounced way. In principle the handle portion may extend - on the middle finger side - from the transition line 11 rearwardly substantially straight and parallel to the longitudinal middle plane of the knife.  
35

The following may be remarked with respect to the top surface of

the handle body. The top face 14 of the head portion 3 is slightly sloping upwardly up to the line 15 (fig. 3) from where the top face of the middle portion is extending substantially horizontally, whereas the top surface of the tail portion 12 is inclined slightly downwardly. Besides the top face 14 shows an inclined profile transversely, sloping slightly downwards from the thumb side to the middle finger side.

A slight impression 16 is made in the upper face 14 which functions as a rest for the index finger of the right hand. The center 10 of this rest is positioned substantially in line with the transition lines 7 and 8, when seen transversely. Due to the slightly inclined position of the top face 14 containing the finger tip impression 16, the index finger will get resting on the face 14, 16 in a position which is slightly tilted to the right. There is a more or less 15 spontaneous offer of two different penhold grips. In one of these the middle finger will be supported on the face 10 in a curved attitude, as explained hereinabove, whereas in the second penhold grip the middle finger will, in a more stretched attitude and in side by side contact with the index finger, support on the slightly concavely 20 profiled sidewall 17 of the head portion.

C L A I M S

1. A handle for a knife blade extending therefrom in a cantilever fashion, comprising a handle body having a head portion, the thickness of which is increasing as seen from the blade insert end, an intermediary portion connected therewith and a tail portion, wherein
  - 5 in use - i.e. with the knife positioned edgewise - the upwardly facing of the head portion surface and an immediately contiguous part of the intermediary portion are sloping rearwardly so as to function as a rest for a finger tip, and wherein on both of the opposite sides of the intermediary portion - immediately adjacent the transition lines
  - 10 to the head portion - concavely profiled finger rests are formed, characterized in that the head portion - as seen in plan view - has a triangular form with a relatively small apex angle, whereas the sidewalls of the head portion are tapering downwardly into a common edge, which extends from the blade insertion end obliquely downwardly
  - 15 and rearwardly, whereas that part of the middle portion which confines the two finger grip impressions is tapering downwardly as seen in a vertical cross section, and wherein the top surface, profiled as a finger tip rest, is sloping slightly downwardly from the right hand side to the left hand side when seen transversely.
- 20 2. A handle according to claim 1, characterized in that the left hand side of the intermediary portion is concavely profiled such that the surface of it, as seen with the handle in its upright position, is formed by a part of a substantially vertical cylindrical plane, which may function as a rest for a horizontally and edgewise positioned thumb.
- 25 3. A handle according to claims 1-2, characterized in that the tail portion is tapering as seen from the intermediary portion rearwardly.

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FIG. 1

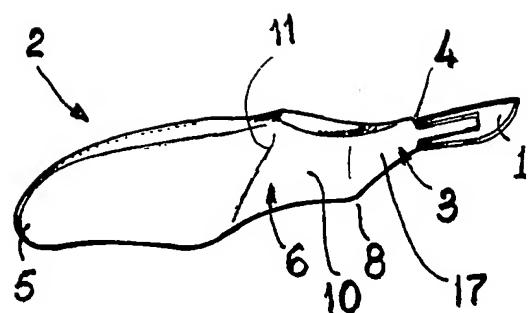
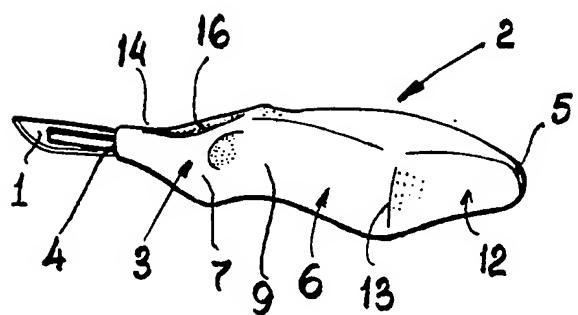
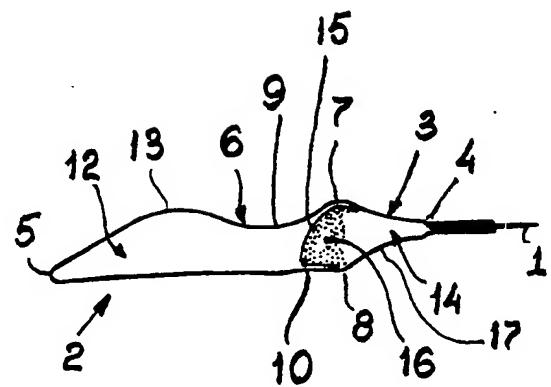


FIG. 2

FIG. 3



## INTERNATIONAL SEARCH REPORT

International Application No.

PCT/NL 90/00164

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all)<sup>6</sup>

According to International Patent Classification (IPC) or to both National Classification and IPC  
 Int.C1. 5      B26B5/00 ;      A61B17/32

## II. FIELDS SEARCHED

Minimum Documentation Searched<sup>7</sup>

Classification System	Classification Symbols			
Int.C1. 5	B26B	A61B	B25G	A47G

Documentation Searched other than Minimum Documentation  
 to the Extent that such Documents are Included in the Fields Searched<sup>8</sup>

III. DOCUMENTS CONSIDERED TO BE RELEVANT<sup>9</sup>

Category <sup>10</sup>	Citation of Document, <sup>11</sup> with indication, where appropriate, of the relevant passages <sup>12</sup>	Relevant to Claim No. <sup>13</sup>
A	DE,A,2729749 (J.BERGER) 11 January 1979 see page 5, line 11 - page 7, line 13; figures 1-4. ---	1-3.
A	EP,A,90256 (MARTOR-ARGENTAX) 05 October 1983 see page 9, line 6 - page 11, line 29; figures 1, 2, 7, 8. (cited in the application) ---	1-3
A	GB,A,2058648 (LITTLE PEOPLE LTD) 15 April 1981 see page 2, lines 56 - 58; figures 1, 2. ---	1-3.
A	US,A,2056054 (J.L.OSGOOD) 29 September 1936 ---	

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## IV. CERTIFICATION

Date of the Actual Completion of the International Search

2

11 FEBRUARY 1991

Date of Mailing of this International Search Report

07.03.91

International Searching Authority

EUROPEAN PATENT OFFICE

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WOHLRAPP R.G.

**ANNEX TO THE INTERNATIONAL SEARCH REPORT**  
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**SA 41750**

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Patent document cited in search report	Publication date	Patent family member(s)		Publication date
DE-A-2729749	11-01-79	None		
EP-A-90256	05-10-83	DE-C-	3309342	01-03-84
GB-A-2058648	15-04-81	AU-B-	533364	17-11-83
		AU-A-	6242080	26-03-81
		CA-A-	1151860	16-08-83
		DE-A-	3035092	02-04-81
		FR-A, B	2464804	20-03-81
		US-A-	4380122	19-04-83
US-A-2056054		None		

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